CLAIMS AS AMENDED IN A FORM SHOWING THE AMENDMENTS

What is claimed is:

1. (Previously canceled)

2. (Previously canceled)

3. (Previously canceled)

4. (Previously canceled)

5. (Previously canceled)

6. (Previously canceled)

7. (Previously canceled)

8. (Previously canceled)

9. (Previously canceled)

10. (Previously canceled)

11. (Previously canceled)

12. (Previously canceled)

13. (Previously canceled)

14. (Previously canceled)

15. (Previously canceled)

16. (Previously canceled)

17. (Previously canceled)

18. (Previously canceled)

19. (Previously canceled)

20. (Presently Amended) A computerized method of generating and rendering over a digital communications network a high-quality perspective view image of an object that can exist in the real world located within, surrounding, or in front of, a three-dimensional scene that can also exist in the real world, the method of presenting a perspective view image of an object in a 3D scene comprising:

producing or selecting at a first computer upon a digital communications network

(1a) a 3D model of the background, (1b) precursors of the 3D background model, (1c) one or more related 2D views of the background scene suitable to serve as precursors of the 3D background model,

(2) for (1b) and (1c) associated dimensional information of the particular 3D scene, and

(3) a suitably-real-world object positioned and oriented in the background scene; and

for which companion low-quality stand-in 3D models are derived or selected for use in rendering a preview image at the first computer;

using scene editing software on the first computer to place the object in the scene, while rapidly rendering the scene at the first computer using the companion low quality stand-ins to guide the placement, a preview quality perspective view image of the object positioned and oriented in the background scene from the desired viewing

angle and camera position for use in allowing a rapid, iterative evaluation and modification of the scene, until the desired perspective view of the scene is obtained, and then (in order to obtain a high-quality perspective view image of the scene);

transmitting from the first computer upon the digital communications network the information (1)-(2) and the identity of the selected object and its location, orientation and other parameters;

receiving at another, second, computer upon the digital communications network the background scene information and object identity and parameters;

deriving in the second computer if not transmitted from the first computer (4) a high-quality 3D background model of the represented and selected 3D background scene; and

utilizing in the second computer the (1)-(2) background scene information and the identified high-quality object and its parameters and any (4) derived high-quality 3D background scene model to generate and render in consideration of (5) a camera position and orientation, (6) a perspective view image of the selected object in the 3D scene; and then

transmitting from the second computer upon the digital communications network the (6) perspective view image; and

receiving at the first computer upon the digital communications network this (6) perspective view image; and

displaying at the first computer this (6) perspective view image;

wherein the object, having an associated geometry, is rendered with specified parameters in proper (1) scale, (2) position and (3) rotation within the perspective view image;

wherein the entire computer-generated perspective view image is rendered and viewed with the same proper perspective that a conventional photo of the same scene would exhibit, if captured by a camera; and

wherein object selection, parameterization, placement and orientation in the scene made interactively over a digital network supports the generation of a

perspective view image having proper parameterization and perspective showing an object located and oriented within a 3D scene.

21. (Previously Added) The computerized method of generating and rendering a high- quality perspective view image according to claim 20

wherein the iterations are further for illuminating the object in the scene so as to develop lighting parameters;

wherein the communicating is also of the lighting parameters; and

wherein the rendering of the second, high-quality perspective view image of the 3D object located and oriented in the 3D scene is further in consideration of the developed lighting parameters.

22. (Previously Added) The computerized method of generating and rendering a high quality perspective view image according to claim 20

wherein the iteration is further for specifying quality parameters of the object in the scene;

wherein the communicating is also of the quality parameters; and

wherein the rendering of the second, high-quality perspective view image of the object located and oriented in the scene is further in consideration of the specified quality parameters.

23. (Previously Added) A computerized method of generating and rendering over a digital communications network a high-quality perspective view image of

a three-dimensional (3D) object that can exist in the real world located within, surrounding, or in front of,

a 3D scene that can also exist in the real world,

the method of presenting a 3D perspective image of a 3D object in a 3D scene comprising:

rendering at a first computer, communicative upon a digital communications network, a first, low-quality, perspective view image of a 3D object in a 3D scene from

(1) a low quality 3D model of the suitably-real-world object,

(2) a relatively low quality 3D model of a selected suitably-real-world scene,

in consideration of

(3) a selected 3D coordinate position and angular orientation of the 3D object in the 3D scene,

(4) location and orientation of a camera view onto the scene,

(5) scene and object size;

(6) parameter of the scene lighting, and

(7) parameters of quality of any one or both of the object and of the scene;

wherein this first, low-quality, perspective view image simply shows the 3D object located and oriented in the 3D scene;

communicating from the first computer upon the digital communications network the information (1)-(7) to a second computer;

from information (1), selecting in the second computer (1a) a high-quality 3D model of the selected suitably-real-world object, and from information (2), receiving at, selecting, or generating in the second computer (2a) a high-quality 3D model of the selected suitably-real-world scene;

rendering at the second computer a second, high-quality, perspective view image from (1) the high-quality 3D model of the selected object, or derivatives or extensions of this model, and (2a) the high-quality 3D model of the scene, or derivatives or extensions of this model, in consideration of at least the information (3)-(7);

wherein the second, high-quality, perspective view image is a high-quality image of the 3D object in the 3D scene;

communicating from the second computer upon the digital communications network to the first computer the second, high-quality 3D perspective view image; and

displaying at the first computer this second, high-quality, perspective view image.

24. (Previously Added) The method according to claim 23

exercised to the purpose that a prospective purchaser of the suitably-real-world 3D object may be rendered the second, high-quality perspective view image of an object that is a virtual object;

wherein should the virtual object be made real in the world, then it would not merely suitably exist within the suitably-real-world 3D scene, but would suitably so exist as depicted in the second, perspective view image.

25. (Previously Added) The method according to claim 23

wherein the rendering at a first computer of the first, low-quality, perspective view image is from (1) a low-quality 3D model of a scene derived at the first computer.

26. (Previously Added) The method according to claim 23

wherein the rendering at a first computer of the first, low-quality, perspective view image is from (1) a low-quality 3D model of the object received upon the communications network from the second computer as a model dynamically generated from specifications provided to the second computer by the first computer.

27. (Previously Added) The method according to claim 23

wherein the rendering at a first computer of the first, low-quality, perspective view image is from (1) a low-quality model of the object received upon the communications network from a third computer as a model from a pre-existing catalog of low-quality 3D object models.

28. (Previously Added) The method according to claim 23

wherein the rendering at a first computer of the first, low-quality, perspective view image is from (2) a low-quality 3D model of the scene received upon the communications network from the second or a third computer as a model dynamically generated from specifications provided to the second computer by the first computer.

29. (Previously Added) The method according to claim 23

wherein the rendering at a first computer of the first, low-quality, perspective view image is from (2) a low-quality 3D model of the scene received upon the communications network from a third computer as a model from a pre-existing catalog of low-quality 3D object models.

30. (Previously Added) The method according to claim 29

wherein the (1) low-quality 3D model of a selected suitably-real-world object received upon the communications network from the third computer is of an object for sale.

31. (Previously Amended) A computerized method of generating and rendering over a digital communications network a perspective view of a three-dimensional object that can exist in the real world located within a three-dimensional space that can also exist in the real world, the method of presenting a perspective view image of a 3D object in a 3D space comprising:

using at a client computer upon a digital communications network

(1) one or more accurately-scaled 3D models representing one or more associated suitably-real-world 3D objects, and

(2) an accurately-scaled model of a 3D scene in which 3D scene the suitably-real-world 3D objects can exist,

(3) associated scene camera and lighting parameters,

(4) associated placement and rotational information regarding where and at what positional attitude the one or more 3D objects are placed within the 3D scene;

transmitting from the first computer upon the digital communications network the information (1)-(4);

receiving at another, second, computer upon the digital communications network the information (1)-(4);

in the second computer

in accordance with at least the information (1) selecting or generating (1a)

a detailed, high-quality, model of the one or more 3D objects.

in accordance with at least the information (2) selecting or generating (2a) a detailed, high-quality, model of the 3D scene, and

in accordance with the (1a) and (2a) models, and information (3)-(4) and extensions thereof, a high-quality perspective view image of the one or more 3D objects properly scaled, located and oriented within the 3D scene is rendered; and then

transmitting from the second computer upon the digital communications network this high-quality perspective view image; and

receiving at the first computer upon the digital communications network this high-quality perspective view image; and

displaying at the first computer this high-quality perspective view image.

32. (Previously Added) The method according to claim 31

exercised to the purpose that a prospective purchaser of one or more of the one or more suitably-real-world objects may be rendered the high-quality perspective view image where at least one of the one or more 3D objects is a virtual object not existing in the world, and which might only suitably exist within the suitably-real-world 3D scene;

wherein even though at least one 3D object shown in the high-quality perspective view is virtual and does not actually exist, the 3D object both (i) could exist, and (ii) could exist as so shown within the high-quality perspective view.

33. (Previously Added) A computerized method of producing a high quality perspective view image on and between at least two computers communicating over a digital communications network, the method comprising:

providing from a server computer across a digital communications network to a client computer (i) a catalog of small, low-quality, 3D graphics models of objects and (ii) at least one 3D graphics model of a scene in which the objects may exist;

selecting at the client computer one or more objects and at least one scene;

communicating these selections from the client computer across the communications network to the server computer;

responsively to receipt of the selections, providing from the server computer across the communications network to the client computer a set of at least the associated small, low-quality 3D models;

manually manipulating at the client computer spatial (i) positions and orientations of a selected one or more object models from the set of models (ii) within the at least one scene model, and rendering at the client computer from these object and scene models, a first, low-quality perspective view image of the one or more selected objects in the at least one scene, this low-quality perspective view image being used as a preview;

communicating, from the client computer across the communications network to the sever computer, at least camera, lighting and image size parameters, and positional placements and orientations of each of the selected and manipulated one or more objects in the at least one scene;

from the received positional placements and orientations of the selected one or more objects, rendering in the server computer from associated large high-quality 3D models of the selected one or more objects and of the at least one scene, a 3D high-quality perspective view image of the selected one or more objects located and oriented in the scene;

communicating from the sever computer upon the digital communications network to the client computer the rendered high-quality perspective view image; and

displaying at the client computer this rendered high-quality perspective view image.

34. (Previously Added) The computerized method of producing a high-quality image according to claim 33

wherein the rendered high-quality perspective view image is suitable to serve as advertising copy, meaning in particular that it is devoid of clearly visible defects;

wherein a 3D graphic artist of this rendered high-quality perspective view image who performs selections and manipulations at the client computer need not have to attend to, and did not actually attend to, the building of the 3D models and any textures,

which building transpired elsewhere.

35. (Previously Added) The computerized method of producing a high quality rendered image according to claim 34

wherein the building of the 3D models and any textures transpired in a model-building computer.

36. (Previously Added) The computerized method of producing a high quality rendered image according to claim 34

wherein the rendered high-quality perspective view image is suitable to serve as advertising copy, meaning in particular that it is devoid of clearly visible defects;

wherein a 3D graphic artist of this rendered high-quality perspective view image who performs selections and manipulations at the client computer need not have to attend to, and did not actually attend to, the rendering, which transpired in the server computer.

37. (Previously Added) A method of rendering at high quality a perspective view image as a business service on a digital communications network, the high-quality perspective view image rendering business service comprising:

providing from a server computer across the digital communications network to a client computer

any of (i) a catalog of small, low-quality, 3D graphics models, or (ii) a tool for generating small, low-quality, 3D graphics models, or (iii) an actual, small, low-quality, 3D graphics model

of at least (1) objects and (2) scenes in which the objects may exist;

receiving at the server computer upon the digital communications network from the client computer information as to the identities of at least one object and at least one scene selected from the catalog, and further information as to the camera and lighting parameters and image size and where and at what orientations selected identified objects are to be placed and oriented in the selected scene;

responsively to received information and further information, rendering in the server computer from associated high-quality 3D models of each selected object and also of the identified scene, a high-quality perspective view image of each selected object located and oriented in the identified scene; and

communicating from the server computer upon the digital communications network to the client computer this rendered high-quality perspective view image;

wherein the client computer is provided with a rendered high-quality perspective view image without necessity of either (i) having the high-quality models from which this high-quality perspective view image is rendered, or (ii) rendering this high-quality perspective view image itself.

38. (Previously Added) A method performed by (i) a relatively simple client computer running relatively simple software (ii) connected upon a digital communications network to (iii) a relatively powerful graphics server computer running relatively sophisticated graphics image rendering software and/or hardware, of deriving at the client computer a high-quality perspective view image as is a typical product of the graphics server computer and beyond the capabilities of the client computer and hardware and software operating therein, at least within a reasonable period of time, the method by which a networked client computer may bootstrap itself to production of a high quality perspective view image comprising:

receiving in the client computer from the graphics server computer across the digital communications network a catalog of, or tool for generating low-quality 3D graphics models for selected (1) objects and (2) scenes in which the objects may exist;

selecting at the client computer objects and at least one scene from the catalog and downloading the selected objects and/or scene from the graphics server computer across the communications network, or, alternatively as the case may be, generating with the tool object and/or scene models;

manipulating at the client computer the received and/or generated low-quality models to specify spatial positions and orientations of objects within a scene;

communicating these object positional placements and orientations, and also

camera, lighting and image size parameters, across the communications network to the graphics server computer;

receiving back from the graphics server computer upon the digital communications network a high-quality perspective view image of the objects placed, oriented, illuminated and viewed from a perspective, as were all derived from the manipulating, and as were communicated to the graphics server computer;

displaying at the client computer this rendered high-quality perspective view image.

39. (Presently Amended) A computerized method of generating and rendering over a digital communications network a high-quality perspective view image of an object that can exist in the real world located within, surrounding, or in front of, a three-dimensional scene that can also exist in the real world, the method of presenting a perspective view image of an object in a 3D scene comprising:

producing at a first computer running a 3D scene editor, Digital Content Creation, Computer Aided Design, or browser program with or without a plug-in a 3D scene file including a three-dimensional scene and a small model of an object that can exist within the scene;

transmitting from the first computer upon the digital communications network the scene file;

receiving at another, second, powerful graphics computer upon the digital communications network the scene file; and

utilizing in the second computer the scene file to generate and render in consideration of (5) a camera position and orientation specified in the scene file, (6) a perspective view image of the object now as a large model in the 3D scene; and then

transmitting from the second computer upon the digital communications network the (6) perspective view image; and

receiving at the first computer upon the digital communications network this (6) perspective view image; and

displaying at the first computer this (6) perspective view image;

wherein the object, having an associated geometry, is rendered as a large model in proper (1) scale, (2) position and (3) rotation within the perspective view image;

wherein the entire computer-generated perspective view image is rendered and viewed with the same proper perspective that a conventional photo of the same scene would exhibit, if captured by a camera; and

wherein the scene specification, made interactively over a digital communications network, supports the relatively rapid ray-traced rendering of a perspective view image having proper perspective, showing an object located and oriented in and as a large model within a 3D scene.

40. (Presently Amended) A computerized method of generating and rendering over a digital communications network a high-quality perspective view image of an object that can exist in the real world located within, surrounding, or in front of, a three-dimensional scene that can also exist in the real world, the method of presenting a perspective view image of an object in a 3D scene comprising:

producing at a first computer running a 3D scene editor, Digital Content Creation, Computer Aided Design, or browser program with or without a plug-in a 3D scene file containing references to 3D objects on the second computer;

transmitting from the first computer upon the digital communications network the scene file;

receiving at another, second, powerful graphics computer upon the digital communications network the scene file; and

utilizing in the second computer the scene file to generate and render in consideration of (5) a camera position and orientation specified in the scene file, (6) a perspective view image of the selected object in the 3D scene; and then transmitting from the second computer upon the digital communications network the (6) perspective view image; and

receiving at the first computer upon the digital communications network this (6) perspective view image; and

displaying at the first computer this (6) perspective view image;

wherein the object, having an associated geometry, is rendered in proper (1) scale, (2) position and (3) rotation within the perspective view image;

wherein the entire computer-generated perspective view image is rendered and viewed with the same proper perspective that a conventional photo of the same scene would exhibit, if captured by a camera; and—

wherein the scene specification, made interactively over a digital communications network, supports the relatively rapid ray-traced rendering of a perspective view image having proper perspective, showing an object located and oriented within a 3D scene.

41. (Previously Added) The computerized method of generating and rendering a high- quality perspective view image according to claim 40

wherein the iterations are further for texturing the object in the scene so as to develop texture parameters;

wherein the communicating is also of the texture parameters; and

wherein the rendering of the second, high-quality perspective view image of the 3D object located and oriented in the 3D scene is further in consideration of the developed texture parameters.

42. (Presently added) A computerized method of generating and rendering over a digital communications network a high-quality perspective view image of an object that can or does exist in the real world located within, surrounding, or in front of, a three-dimensional scene that can or does also exist in the real world, the method of presenting a perspective view image of an object in a 3D scene comprising:

first maintaining upon a server computer upon a communications network both a high resolution 3D model, and a low-resolution stand-in proxy model, of a same object that can or does exist in the real world;

second maintaining at a client computer upon the same communications network an image of a scene that can or does exist in the real world, and in which scene the object is desired by a user to be viewed;

first downloading on the communications network the low-resolution proxy

model, only, from the sever computer to the client computer;

manipulating at the client computer interactively with a scene editing software both the low-resolution proxy model and the scene image so as to form a low resolution image of the object in the scene according to the dictates of the user;

uploading upon the communications network the scene image, and at least the parameters of the user-dictated low-resolution image, from the client computer to the server computer;

rendering on and at the server computer running imaging engine software in consideration of at least the downloaded user-dictated low resolution image parameters and the scene image, and also the high-resolution 3D model, an image of the object within the scene that is of higher resolution than is the low-resolution image from the client computer;

second downloading upon the communications network the rendered higher-resolution image from the server computer to the client computer; and

displaying the higher-resolution image at the client computer;

wherein the high-resolution 3D model does not leave the server computer during any of the first maintaining, the second maintaining, the first downloading, the manipulating, the uploading, the rendering, the second downloading, and the displaying.